

Transition

Although there is considerable debate and disagreement over the degree of jeopardy in which the human race has placed itself with regard to exceeding the carrying capacity of Earth, it should be obvious even to the most ardent supporters of expansionist economic systems that reliance on such systems cannot continue indefinitely. An ever-expanding human population, coupled with an intensifying materialism, simply cannot be sustained by a closed and finite planet. At some point in time, this exploitative trend will have to be reversed. Judging from the massive transformations humans have inflicted on the environment in less than 200 years, it would seem that another 200 years of "business as usual" would so disrupt our ecological support systems that our demise will be inevitable. Of course, it would be neither wise nor prudent to effect a change of course after the ship has collided with the iceberg. After all, most of us not only wish to enhance our present standard of living but would also like to ensure a bright future for our children. The surest and only way to "have our cake and eat it too" is to begin an immediate course correction to avoid the iceberg.

An effective transition to harmonious interaction with the ecosystem---an absolute requirement for a sustained, flourishing existence for *Homo sapiens*---will require an unwavering commitment to the following goals:

- ** Global population reduction followed by population stabilization.
- ** Adoption of a serious and comprehensive "Conservation Ethic".
- ** Institutionalization of educational programs emphasizing humankind's link to and interdependency with nature--ecological awareness training.

In pursuit of these goals, the authors would suggest the establishment of a "Department of Population Management and Ecology." This would ideally be a world tribunal with appropriate national counterparts, but certainly could initially be instituted in the United States as a prototype agency to begin exploring the possibilities and promise of a new era of harmonious human endeavor. This department would eventually displace the bureaucratic and narrowly focused Environmental Protection Agency. This new department is envisioned as being invested with broad authority to conduct comprehensive research in areas pertaining to global and national resource inventories, resource utilization, waste generation, recycling and disposal. In addition it would establish goals and timetables for population reduction, would monitor industrial efficiency and provide land-use guidelines and would be responsible for safeguarding and re-establishing diverse natural habitat.

The scope and authority of this agency is necessarily broad, because virtually all of humankind's diverse activities bear directly on the environment and ecological systems. This comprehensive , interactive agency would work in conjunction with other existing and future departments of government but ultimately its authority would supersede all others, since national and world consensus is critical to attainment of stated objectives.

Although the transition from an expansionist to a quiescent world economy will likely be no picnic, certain current and sweeping global transformations may smooth the waters. With the recent democratization trends occurring throughout the world, and particularly the Eastern-bloc countries

and the Soviet Union, the long dreamed of goal of world peace may actually be materializing, at least rudimentarily. This is important, of course, because cooperation, rather than competition and distrust is a prerequisite to the establishment of new world priorities. As the Cold War economies of nations are redirected to peacetime economies, the opportunity begins to emerge for redirecting the immense resources presently used for defense and the waging of war. The more than \$7 trillion dollars the United States has spent on defense since the end of WWII provides a glimpse of a future which this kind of ideological and monetary commitment to a new and nobler cause might engender.

Since the Armed Forces and Defense industries are presently such massive and crucial components of the national economy of many nations, redirecting their efforts in support of environmental causes, as international hostilities lessen, is not just prudent and politically sound policy. It is essential to salvaging the environment, conserving resources and providing the opportunity to re-establish a diversity of plant and animal life to a planet too long plundered by economic opportunism. Defense contractors, which presently employ huge numbers of workers, could begin to bid on alternative energy projects rather than Stealth bombers. Government contracts might be awarded to Boeing or Lockheed for research and development of prototype personal vehicles which are energy efficient and non-polluting. Pollution abatement technology could become the major domain of former defense industries. The Armed Forces could increasingly be employed in civil engineering projects related to environmental reclamation, including extensive reforestation programs--envision paratroopers being airlifted to a devastated and remote Amazonian rain forest to reclaim the forest, rather than blow up a bridge. The Army Corps of Engineers could design and build secure and environmentally sound toxic waste disposal sites, rehabilitate the nation's rivers, lakes and harbors, and develop and administer large-scale recycling and conservation programs. As the population declined and habitat stress ameliorated, the same corps of Engineers that wrested the deserts and prairies from the bison, cacti and sage hens could repent for its sins, by recreating the once pristine habitat that all of God's creatures have a right to share.

It is painfully obvious that we are not all of one mind about conservation and the need to conserve. We have no national consensus on conservation, no national policy to promote it. There are controversies about protecting resources that seem to defy solution. When jobs are threatened by conservation efforts, people naturally are not in favor of changes that they see as interference in their regional economy. Inertia is difficult to overcome, even when it is obvious that protecting resources is in everyone's interests, business included. Methods of recovery and waste reduction can save millions and even billions of dollars, but much of the world is only slowly becoming aware that our environment cannot continually provide unlimited resources or absorb those things we term "garbage."

Some people feel that there is little need to conserve. They are convinced that the indications of a decline in a resource such as oil, for example, is merely a means of increasing the price of oil and that there are ample and undiscovered reserves available. In other words, we are being "ripped off" again by big business. There is no doubt that this happens. We have seen more than a few instances where artificial shortages have been created to increase profits in many industries, or where prices have increased before a shortage could possibly have an effect, as with the Valdez oil spill. Others are sure that the estimates of resource depletion are being manipulated for shock value, and that we will have plenty of energy in the future. Some estimates of oil reserves indicate that we may find enough oil for another century or more. Even if this turns out to be true, 300 years is an astonishingly short time to have completely drained every drop of a resource which has supported

the Industrial Revolution and defined modern civilization. It is always prudent to keep in mind that we are dealing with a fixed amount of resources, that a growing population uses increased resources, and that development of resources always yields by-products, some of which are useable and some of which are pollutants. Development of resources on a mass scale has brought us to our present impasse, where we are now forced to deal with problems we have ignored for many years.

It would seem that we need to have information on all aspects of our energy use and then we could proceed with some sort of comprehensive energy policy which would be more ecologically sound. Using the elaborate technology of our "information age," we could assemble the necessary information and synthesize it into a logical proposal for more efficient energy use in the future. The odd thing is that many such proposals have already been made and ignored. We could glean pertinent information from ideas of the past to realize conservation goals. Perhaps we could divert some of our best researchers from the contemplation of lasers in space and put them on the track of ways to achieve more efficient energy use, to augment source waste reduction, to stop environmental decline and to improve recycling efforts.

There are many other beneficial steps that we could take. Many of these steps are now receiving more attention as we move closer to the turn of the millennium. Most of them are not "new" ideas, but as we begin to recognize our environmental plight we become more willing to listen to those who have been developing conservationist programs for many years. We could have been pursuing many of these policies all along, but it seems to take crises to overcome our inertia. These are some of the things we could and should pursue globally:

** Assess our resource base worldwide, as China did on a national scale. Some of the work in this area has already been done and could be incorporated. Without a firm grasp of our resource base, however, we tend to think that we are dealing with endless resources, and so we act accordingly, doing little toward conserving.

** Develop small scale, decentralized technologies using the knowledge of regional people. Small scale development is consistently more efficient and hence less ecologically damaging. Conversely, we must stop funding large scale projects which do not employ as many people as smaller projects do, are not as energy efficient, and are consistently more damaging to the environment. The World Bank and International Monetary Fund are currently assessing their lending policies in terms of reducing lending to environmentally damaging projects.

** Develop world energy and environmental policies. There are indications that many countries are awakening to the environmental no-win situation we face at present, and are interested in finding solutions. Each nation is forced to confront its own environmental problems at home, while realizing what a small world it is, as pollution refuses to recognize borders and creates global crises. It is sobering to consider that, according to Lester Brown, President of Worldwatch Institute, "the great majority of Third World countries have crossed the sustainable yield thresholds of their basic biological support systems." (83)

** Encourage worker self-management. People must have a stake in the success of the system. Workers will find cost savings and therefore increase efficiency if they are included in the process of management.

** Examine large-scale systems, such as mass transit, to assure that they provide an energy-efficient and attractive alternative to private transportation. Encourage and offer incentives for use of mass transit.

** Pursue alternatives to fossil fuel dependent vehicles. Increase efficiency of transport to eliminate greenhouse gases. We already know that this can be done without dire consequences to the economy. Following the oil shock of the early 1970's, the United States went for 13 years without an increase in energy use, even though the economy grew by 35 percent in this period. Prompted by higher fuel prices and by government action such as the congressionally mandated auto-efficiency standards, we went further and did more with the same amount of energy. (84)

** Take all possible steps to ban the manufacture of CFCs, chemicals involved in both the greenhouse effect and the depletion of the ozone layer.

** Require timber industries to engage in vigorous reforestation. Discourage mass deforestation. Recognize that healthy forests are habitat for wildlife, that they reduce erosion and that they provide a welcome wilderness experience. Healthy forests and vegetation also absorb carbon dioxide, a major greenhouse gas.

** Encourage restoration of upland watersheds, lowland marshes and pothole wetlands.

** Recognize that poor countries are often selling their resources in order to exist, and that they will not be able to pay off debt and implement ecologically sound policies at the same time. Therefore, assistance from the wealthier nations in exchange for sound environmental policies must be forthcoming. Ban hazardous waste dumping in Third World countries. It is intolerable that the industries of the technologically developed nations use Third World nations as their dumping grounds, when they know that environmental laws in their own countries would not allow such behavior. Develop worldwide environmental standards to ensure that toxic waste dumping will be illegal everywhere.

** Recognize the environmental cost of products. Until we realize that a product is the responsibility of the manufacturer from cradle to grave, we will allow anyone to use resources in any manner they choose, whether the product comes back to haunt us as a toxic waste that is solid, airborne or liquid. Our present system allows that the manufacturer's responsibility ends once the product is sold, and so anyone can produce a substance whose final disposal must be dealt with by the taxpaying public, though that taxpaying public is not reimbursed by the manufacturer. There is no truly private enterprise. For too many years we have absolved manufacturers of any responsibility for the by-products of their manufacturing. Our increasing knowledge of environmental systems and the hazards to the environment implicit in economic growth make it necessary to question all of the economic truisms upon which we have based our thinking. Plastic diapers, styrofoam packaging, cleaning compounds and a multitude of other products seem innocuous enough until we find that they often last much longer than our life spans, and sometimes have effects on our environment that we had not expected and do not care for. In the industrialized nations most of us have little actual contact with the earth which supports us. We are far removed from the recognition of our constant dependence on sound ecological systems. The way we package goods makes it appear that food

comes in boxes, wrappers and jars, sometimes made of plastic, sometimes not. Our disposal of goods indicates that we have no concept of the complexity involved in the natural breakdown of substances. Source waste reduction should be mandated for manufacturers. It is economically more viable than recycling, waste treatment or--last and least--waste "disposal," which is our common method of trying to conveniently ignore our waste. Waste reduction is economically proven as an alternative with enormous potential.

** Stress the importance of truly biodegradable products. Photoreactive garbage bags and diapers are not biodegradable, though advertised as such.

** Address the problem of air pollution, including acid rain. Recognize that acid rain is a product of modern industrial society. The cost of smokestack scrubbers, as opposed to the cost of attempting to restore ecologies, is much, much smaller.

** Strictly regulate the manufacture and use of toxic chemicals. Substitute less toxic chemicals wherever possible. Reduce or eliminate the use of synthetic agricultural fertilizers and pesticides in favor of alternative approaches to pest control and soil replenishment. Eliminate the use of phosphate detergents.

** Recycle all that can be recycled. People can become quite enamored with recycling when they are aware that it is something that they can do on the grassroots level. Japan recycles 50 percent of its waste, Western Europe 30 percent, the United States 11 percent. A major component of any transition effort has to include comprehensive recycling. It drastically reduces the drain on resources while being considerably more cost effective than processing raw materials. Urban mining of landfills is progressing from the image of "scavenging" to a viable future industry. While a ridiculous alternative to initial recycling, it is still more efficient than extractive procedures. Though less romantic than its counterpart, it may be the new Klondike.

** Recognize that we should process no raw materials until the potential for recycled products is exhausted. Mandate industrial, institutional and consumer recycling. It is impossible to recycle products for which there are no markets.

** Allow no new energy projects (nuclear, coal-fired, hydroelectric) unless and until maximum conservation procedures have been demonstrably utilized. Continue to utilize the nation's energy production facilities, including existing nuclear power plants and fossil-fuel electrical generating stations until population reduction and conservation measures begin to exert sufficient effect to allow their gradual decommissioning. Increase energy efficiency at all levels, including manufacture and use of products. We should be doing much more worldwide to use cogeneration and weatherization to conserve heat. Provide economic incentives for conservation of energy, rather than the current system employed by many electrical utilities which charge conservation-minded energy users more per kilowatt hour than their wasteful counterparts. There is no reason these measures cannot be taken. Most market oriented economies have improved their energy efficiency by between 20 and 30 percent since 1973. During a time when there was almost no net increase in supplies, efficiency developed to a point where it now displaces \$250 billion worth of oil, gas, coal, and nuclear power annually in industrial market countries. (85)

** Continue all energy-related research including that involving nuclear fission and fusion, but authorize no new technological application until all ramifications of such technologies have been thoroughly evaluated and demonstrated as efficient, cost-effective and environmentally sound via small prototype application. Accelerate research on nuclear waste detoxification and disposal.

** Conserve water in all ways possible. Remove subsidies which benefit those who can afford to pay for this important resource. Inertia in the system allows such subsidies to continue long past their useful life. Disseminate information on microirrigation. Indian farmers who flood their fields with water delivered through unlined canals lose 85 percent of the irrigation water potentially available for uptake by plant roots, but Israeli and California farmers using drip irrigation precisely scheduled to crop requirements use 85 percent of the water potentially available. (86) Using water in excess of the sustainable level of the deep well water table in desert reclamation projects should be strictly prohibited. Tailor agricultural crops to appropriate climates to conserve water usage.

** Institute best-use land policies which stress linking soil characteristics and climatic conditions of specific regions to the most appropriate use. For example:

---No landfilling of marshes for airports

---No large-scale desert reclamation projects

---No community development in areas where the water resource base is insufficient.

---No use of arable lands for agriculture related to ethanol production as an energy source.

---No use of arable lands for condominium development, industrial parks or used car lots.

** Make better choices in buying products. Corporations have sold a willing public on the idea of buying convenience, but by doing so we pay for a product many times which could have been a one-time purchase. The eventual disposal of "disposable" products fills landfills swiftly. We can demand quality: better products with longer life spans.

** Protect wildlife and habitat. Our inadvertent slaughter of wildlife through ocean pollution and encroachment is as shocking as our relentless decimation of species through poaching, driftnet fishing and selective extermination. Our man-centered view of nature blinds us to the reality of our callous disregard of other species except as we find a use for them. We see nature as a catalog of products which we can use or discard as we see fit. Our hearts quake at the thought of invasion of our homes, murder of our families and destruction of all that we hold dear---yet this is precisely what we do every day to other species. For the majority, our only concern is how this destruction will affect humanity's future---will there be a representative sample of wild animals for our personal amusement? Will there be seal pelts to fulfill the desires of the fashion designers for the jet set? Will there be enough game for fishing and hunting? It is almost impossible for us to see other species as being worthy in their own right. The life of a United States citizen may be worth millions, as established by jury sympathy, while the life of an arctic tern snuffed out by a crude oil spill is worth a dollar as established by the Exxon corporation. We need to develop a more loving view of our fellow creatures through education which stresses their intrinsic worth.

** Develop strong international measures to end ocean pollution.

** Expand on the use of conservation practices that are working at present or have worked well in the past. There are endless examples such as: ---The 3M corporation successes in cutting waste and saving money; ---Israeli agriculture and microirrigation; ---Chinese reforestation and other methods to stop erosion; ---Food first programs which stress feeding people before exporting agricultural products; ---Recycling and energy efficiency programs in Japan, Western Europe and even the United States.

To give you a comprehensive review of the various steps we could take to improve conservation would take several highly technical volumes, and that is not the intent of this book. Technologies are available or are being developed. That is not the problem. People are extremely ingenious and there is no doubt that if all of us were in general agreement we would rapidly make stunning progress in conserving our resources. The problem is that we are either not in agreement about conservation or are ignorant of the need for it. We have been seduced by the "convenience" of discarding those things which we no longer want, but the consequences of doing so are much more than simply inconvenient.

Now for the question which strikes terror into the hearts of corporate and government entities everywhere: Where will the money come from? It will have to come from those nations who have had the greatest benefit from the resources they have developed. Most of these steps will initiate the rebuilding of the global savings account. The industrialized nations, and in particular, the United States, have drawn most heavily on this global savings account since the beginning of the Industrial Revolution. We won't be doing anyone any favors or granting any charity by replenishing the account. In fact, we will be working to save ourselves, so any thoughts of altruism and nobility can be set aside. And, lest we forget that money saved is money earned, there is a totally pragmatic financial return on this ecological investment. Sound environmental policies are sound economic policies. Conservation (or the lack of it) is seldom mentioned in the furor over the United States' continual struggle with our multi-billion dollar deficit, but it is odd that a nation which is in such debt is still throwing away "garbage" that others turn into cash. We are ensuring economic failure by wasting our resources and pursuing other environmentally damaging policies. What we are doing day by day is throwing away and burning millions and billions of dollars. The lunacy of such a policy would be apparent if we were literally taking crisp new bills to the dump and setting fire to them. The media would have a field day, and our ponderous bureaucracy would change the policy allowing such waste with amazing, unheard of speed. But we are quietly burning this money in large cities and small towns across the USA. We are paying people to haul the money away and burn it. If a wealthy individual were to pay someone to burn his money, his heirs would have him carried away directly for observation and rest, and everyone would applaud the move. But we cannot seem to see the absurdity of our national policy which concerns itself with the convenience of discarding, rather than the eventual necessity of cleaning up the discards.

In analyzing our economic process we find that we pay for products several times:

** When they are resources to be removed from their point of origin

** When they are transported to an area where they will be manufactured into goods.

** For the actual manufacturing process.

** For attractive packaging.

** For transport to an area where we can locate the product.

** For advertising to make us realize that we have an undeniable need for the product.

** Finally, for sending the product to its final resting place, the graveyard of goods. Here we pay for transporting the product to the landfill, burning (or other disposal) of the product, the attempt to clean up wastes which prove to be toxic, the lawsuits generated by damage created when toxic chemicals leach into the soil and water systems, and the revenues lost by not recycling. Additionally, we create seemingly insoluble problems of waste disposal which grow more costly as time goes by. Had we begun dealing with these problems in decades past, the costs associated with them would have been minimal in comparison to those we now face.

It is no secret that we in the United States have been the top consumers of resources for quite some time, and that we feel we can "afford" to discard our playthings when they no longer hold our fancy. There is little or no consideration about the economic absurdity of such arrogance. But the party is over. Day by day we see that the bills are coming due, and our credit cannot be stretched much farther. Our status as a world power has partially been maintained at the cost of environmentally disastrous policies. But the historical perspective shows that the entire period of civilization is a blip on the screen of human time on Earth, that the entire spectrum of human habitation on earth is a mere blip on the screen of the history of the planet itself. How brash to assume that the United States' era of world domination is the best that humanity can achieve, or that it will continue indefinitely. It would be cause for optimism if we were pursuing energy efficient policies in a comprehensive manner, but projections indicate that energy gains through conservation of 2.5 percent per year since the mid-1970s have fallen to 0.5 percent in 1987. Art Rosenfeld, director of the Center for Building Science at the Lawrence Livermore National Laboratory at Berkeley, California noted that because attitudes change slowly "we haven't paid attention to investments that take five, six or seven years to pay back, like the Germans and the Japanese do." (87)

Changing our habits to implement greater efficiency is the least we can, and must do. It is strange, though not unusual, that we in the United States have refused to use our wastes even when it is in our best interests. We also have to recognize, however, the fact that all conversion of energy has by-products, and even if we use those by-products to our advantage, we cannot recapture all of the energy that was originally available. Jeremy Rifkin made this point clearly:

"Many people believe that almost everything we use up can be totally recycled and reused if only we develop the appropriate technology. This just isn't true. While more efficient recycling is going to be essential for the economic survival of the planet in the future, there is no way to achieve anywhere near 100 percent reprocessing. For example, recycling efficiency today averages around 30 percent for most used metals. Recycling requires the expenditure of additional energy in the collecting, transporting, and processing of used materials." (88)

Additionally, recycling, waste treatment and other strategies all create their own by-products in a

never-ending cycle. No matter how many comprehensive conservation measures we employ, we still must reduce the population to be successful in confronting our problems of excessive consumption. As Charles Park, dean of the Stanford school of Earth Sciences observed:

"Economic reserves of raw materials are widely scattered and increasingly hard to find. As population increases, so does demand. Increasing demands against diminishing reserves mean inflation, devaluation of currency at home and abroad, compounding of the problems of emerging nations, and wider discrepancies between nations that have more and nations that have less, all of which can lead only to increasing international tensions. The earth is a finite body and can support only so many people at acceptable standards of living. " (89)

At some point in time, we would reach the threshold of benefits to be realized through conservation measures. Conservation possibilities cannot keep growing infinitely. So we return to the main premise of this book. We must begin making it a priority to restore our ecological support systems. Recycling and other conservation strategies are good interim measures which should be implemented and maintained once the population has decreased, but they will not solve the essential problem. At the top of the hierarchy of integrated solid waste management is source waste reduction. The first element of source waste reduction is fewer consumers, thus there is a direct connection between source waste reduction and population reduction. **Population reduction and conservation are inseparable.**

Whether or not we wish to stop the expansion of the human population is not the question before us. The question before us is this: How will our assault on the environment stop? Will it stop because we exceed our carrying capacity to the point of mass starvation, thereby "reducing the excess population," as Dickens expressed it through the character of Ebenezer Scrooge? Will it stop because we contaminate our environmental systems to the point of breakdown, inviting public health disasters? Or will it stop because we choose an overall path of conservation--seeking out all means of increasing efficiency in our energy use, recycling waste as a matter of course rather than haphazardly, rejecting those technologies which produce toxic wastes, and, most importantly, reducing the population?